



**EHS0381**

**Electrical Equipment  
Safety Program (EESP)  
Surveyor Course and Field  
Guide**

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**Lawrence Berkeley National Laboratory  
University of California**

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## Introduction

What is an Electrical Equipment Safety Program (EESP) Surveyor?

An EESP Surveyor is any person designated by their Division, program, project, or line supervisor, to look at electrical equipment and create an EESP survey. The purpose of the EESP survey is to create a list of electrical equipment that will later be inspected by a designated EESP Equipment Inspector. After completing this course, you will be qualified to be a Surveyor. You will NOT be qualified to be an EESP Inspector.

You, the surveyor, are documenting electrical equipment that has **not** been certified by a Nationally Recognized Testing Laboratory (NRTL). You are only required to identify equipment that needs further inspection, and document it accordingly. This will enable the Equipment Inspector to later examine and evaluate the electrical safety and acceptability of the equipment.

The survey **is** a comprehensive list of all electrical equipment in the Lab.

The survey **is not** a list of all unapproved electrical equipment in the Lab.

This workbook will provide you with the skills, knowledge, and abilities to perform the survey correctly.

This workbook may be printed and used as a field guide to assist you with your survey.

## Learning Objectives

Upon completion of this workbook course, the student will be able to:

- Distinguish (unapproved) equipment that needs an inspection from (approved) equipment that needs no further action.
- Identify, document, and appropriately label equipment.

## Glossary of Terms

**Affected Equipment** — All electrical equipment is potentially affected by the survey process. This includes new, old, commercially procured, and LBNL-developed equipment.

If the equipment plugs into a facility (e.g., 120-volt) receptacle, or is directly wired to facility power, it is Affected Equipment.

If the equipment is powered by a low-voltage transformer that plugs into facility power, it is affected equipment.

NOT affected: Battery or other externally powered equipment that operates at less than 50 volts (V) or less than 5 milliamps (mA) and equipment that is part of the Facilities building power supply.

**Electrical Equipment Surveyor** — Personnel identified by their Division to conduct the NRTL Survey for their organization are referred to as “Electrical Equipment Surveyors.” Before conducting the survey, Electrical Equipment Surveyors must complete this training.

**Equipment Supervisor** — see Responsible Person.

**NRTL** — Nationally Recognized Testing Laboratory. An organization which is recognized by OSHA and which tests for safety, and lists or labels or accepts equipment based on established Standards: The NRTL is an independent third party and is not the manufacturer of the product or a government agency. A full list of NRTL labels is provided later in this workbook (Appendix B). The latest list of NRTL labels can be found at <http://osha.gov/dts/otpc/nrtl/nrtlmrk.html>.

**Recognized Component** — Underwriters Laboratories (UL) Component Recognition Service covers the testing and evaluation of component products that are incomplete or restricted in performance capabilities. These components can be used in complete end- products or systems listed by an NRTL or inspected by an Electrical Equipment Inspector. The Recognized Component mark by itself does NOT constitute NRTL certification. UL's Component Recognition Service covers millions of components, such as plastics, wire and printed wiring boards, that may be used in either very specific, or a broad spectrum of end- products, or even components such as motors or power supplies.

**Responsible Person (RP)** — Also known as Equipment Supervisor. The RP is the person who is most directly involved with using the equipment. The RP should be directly knowledgeable about the function and intent of the equipment.

## Your Responsibility

Your only responsibility is to survey, as directed by supervision, electrical equipment in your program, and develop a detailed list of equipment that needs further inspection. The information in this course will help you to meet this goal. You can also use this document in the field to help you with this task. You are not authorized by this course to actually inspect or evaluate the equipment.

## What Equipment Do I survey?

The purpose of the Electrical Equipment Safety Program is to find and inspect all non- NRTL electrical equipment. Although the regulations apply to everything from particle accelerators to wall switches, you will NOT look at the types of appliances and equipment that is rarely found to be non-NRTL.

### Do not survey:

- Standard office equipment; Copy machines, fax machines, plug strips, etc.
- Consumer appliances; refrigerators, desk fans, lamps, etc.
- Personal computers
- Common electrical construction devices; conduits, receptacles, switches, etc.
- Customized Facilities-type equipment used in your programmatic space, such as a multiple outlet box.



### Do survey:

- All commercially built programmatic scientific equipment.
- All custom made equipment.
- All Lab-built equipment

### **CAUTION:**

**Personnel performing the survey are not to expose themselves to electrical hazards. Unguarded electrically energized parts must be avoided. Contact your Division Safety Coordinator or EH&S Electrical Safety at x4694 for guidance if such conditions are discovered.**

## **Instructions**

To complete this course:

1. Read this entire workbook, including all of the examples. Read all the information before beginning the test exercises.
2. Complete the test exercises in the workbook by recording your work on the Electrical Equipment Surveyor Worksheets, located at the end of the Test Exercise
3. Sign and mail your completed test exercise to: **Stephanie Collins 78R0101.**
4. After the test has been graded and an acceptable score earned, credit for this course will be posted to your training record, you will be sent a supply of labels, and you will be granted access to the Electrical Equipment Inspection database.

During your course of study, you may contact the **EESP Manager, Mark Scott, ext. 4694** with any questions.

## **Survey Procedure**

### **Materials and Supplies**

You will need the following to perform a survey for your program:

1. A supply of Equipment Surveyor Worksheets (Appendix A). You can document up to 7 pieces of equipment per 2-sided worksheet. You will later transfer the information from the worksheets to the database. If you prefer, you may enter the data directly into the database from the field using a portable computer.
2. A supply of identification stickers (see page 10): AHJ Bar Codes, green NRTL stickers, and red Out Of Service Stickers. After you receive credit for this course, you will be sent a supply of stickers.
3. List of NRTL marks (Appendix B).
4. List of Unacceptable marks (Appendix C).
5. A digital camera (iPhone camera is fine).
6. Optional: flashlight and inspection mirror to help you see behind equipment.

## Procedure

Before Surveying: take charge of your own safety, remember:

- You are surveying equipment, you are not authorized for exposure to any electrical hazard
- Do not open equipment. If equipment is open, call the Electrical Safety Office (x4694)
- Be aware of room safety signs/labels, obey all instructions and wear any PPE that is required by the room hazard. Be aware of the hazards of the room at all times.

For each piece of electrical equipment, do the following:

1. Notify the Equipment Supervisor (owner) that you need to perform the survey. It is most helpful to have the equipment supervisor present during the survey to assist with the survey and answer questions about the equipment.
2. Determine whether the equipment is Affected Equipment.
  - a. If the equipment plugs in or is directly wired to the facility electrical system it is Affected Equipment. Go to Step 3.
  - b. If the equipment is powered otherwise, e.g., battery-powered, determine if there is 50 volts AND 5 milliamps or greater in any part of the equipment. If so, it is Affected Equipment. Go to step 3.
  - c. If the equipment is not Affected Equipment, no marking or documentation is needed. Go to the next piece of equipment.
3. Check entire equipment surface for an acceptable NRTL mark. See list of NRTL marks in Appendix B.
  - a. If an acceptable NRTL mark is found, place a green NRTL label on front of the equipment with your initials. Do not attach a bar code label. Do not log the equipment on your worksheet or in the database. Go to the next piece of equipment.
  - b. If NOT NRTL labeled:
    - i. Place an LBNL AHJ bar code label in a visible location.
    - ii. Take a medium-resolution digital photo of the equipment front and back. You will later download the photo(s) to the database record of this equipment to help the inspector identify it. You may take several photos if necessary to identify the equipment.
    - iii. Enter equipment information into the Equipment Surveyor Worksheet or directly into the database. Go to the next piece of equipment.
4. Assign a priority. There is a place on the Worksheet to enter a Priority. The Priority choices illustrated in the following graphic include: , **L**- Low, **M**- Medium, and **H**-High. Note in the Comments box the reason for an **M** or **H** priority.



Risk Group	Description	Inspection Priority	Conditional Use (use prior to inspection/approval)
1	All other equipment not in Risk Groups 2-4	High	No, unless legacy equipment already in use
2	>208 VAC equipment built to CE or similar foreign standard	Medium	No, unless legacy equipment already in use
3	<ul style="list-style-type: none"> <li>120 VAC equipment built to CE, CSA or similar foreign standard</li> <li>Any CSA</li> <li>Equipment identical to equipment already inspected (same make &amp; model)</li> <li>Equipment from designated trusted manufacturers</li> </ul>	Low	Yes
4	NRTL Listed equipment	Only if modified or used outside of listing criteria	N/A

**Any equipment that is imminently hazardous (e.g., has exposed energized parts 50 volts and 5 milliamps or greater) shall be immediately removed from service!**

### **Equipment Treated as an *Assembly or System***

You may encounter an assembly or system of electrical devices that creates one integrated electrical product. For example, an equipment rack that has been built exclusively for a particular experiment and is not expected to be reconfigured. In such a case, you may apply only one bar code and make only one Worksheet entry to cover the entire assembly.

If you label equipment as an assembly, select “System / Assembly” for Equipment Type in your Worksheet entry.

The determination to treat something as an assembly is subjective and best made in consultation with the equipment supervisor. When the EESP Inspector later inspects the equipment, they may decide to change the designation.



Use your best judgment when deciding to assess something as an assembly.

## Equipment That Has Been Modified

When an NRTL certifies electrical equipment, it is with the understanding that the equipment will be used in accordance with the intent of the manufacturer. If you find equipment that looks like it is not being used as intended, or has been modified beyond its original design, treat it as though it is not NRTL certified. Apply a bar code and log it into the Equipment Surveyor Worksheet or directly into the database. Explain your concern in the Comments box. Equipment that has been locally modified should be rated HIGH risk.

Some examples of this are:

- Damaged enclosures
- Upgrades to power supplies or other components
- Use in an environment other than indicated on product, e.g., outdoor, high temperature, cryogenic, etc.
- Mounting / installation of equipment not consistent with instructions

Use equipment documentation, equipment labels, and the knowledge of the equipment supervisor to help you determine if the equipment has been modified.

**Note:** equipment that has been repaired is not considered modified unless the repair has changed some feature of the equipment.

## Equipment That Is No Longer In Use

Non-NRTL equipment that is not expected to be used in the foreseeable future is **not** required to be entered into the survey. Do not attach a bar code label to this equipment. Do not make a Worksheet entry. Instead, place a red “Out of Service” sticker in a prominent location on the equipment.



## Surveyor Label Summary

1. **AHJ Bar Code Label (Mandatory)** indicates that equipment needs to be inspected. Specifically, the equipment is **not** NRTL certified and exceeds 50 volts potential and 5mA current capability, or it is NRTL equipment that has been modified. Take a photo and make a Surveyor Worksheet entry for this equipment. **NOTE: When entering bar code number, you may omit the leading zeros.**



2. **Green NRTL Label (Optional).** For equipment that is NRTL certified, hasn't been modified, and appears to be used as intended by the manufacturer, a green NRTL sticker may be initialed and affixed to the equipment in a visible location. This is a convenience to the surveyor and equipment supervisor, since the NRTL mark may not be readily visible. By attaching this label, you are communicating that the NRTL mark appears somewhere on the equipment, and others will not need to look for it. Do not make a Surveyor Worksheet entry for this equipment.



3. **Red Out Of Service Label.** Equipment that is not being used, is not intended to be used in the foreseeable future, and is not connected to an electrical source, is **not** required to be surveyed or inspected. This sticker informs the user that an inspection will be required before the equipment can be used.



4. **Yellow: AHJ Conditional Acceptance Label.** Equipment that has not passed the equipment inspection but that may be used under certain conditions. Includes situations where: (a) the equipment has not yet been inspected, (b) the equipment has failed inspection but is temporarily authorized for use pending repairs if the reason for the failure does not represent an immediate hazard, and (c) the equipment has passed inspection but has certain limitations on its usage.



## Examples

Here are some examples of different types of equipment and how you should process them.

There are seven examples, followed by a sample Worksheet that has been filled in with the correct information. If the equipment is NRTL-Listed, no entry will appear on the Worksheet.

You are not making any decisions about whether or not the equipment will pass inspection.

**You are only determining the NRTL status, applying the correct identification stickers, and entering information on the Equipment Surveyor Worksheet, as necessary.**

**Note:** When entering bar code number, you may omit the leading zeros.

### Example 1:

NRTL Listed Equipment

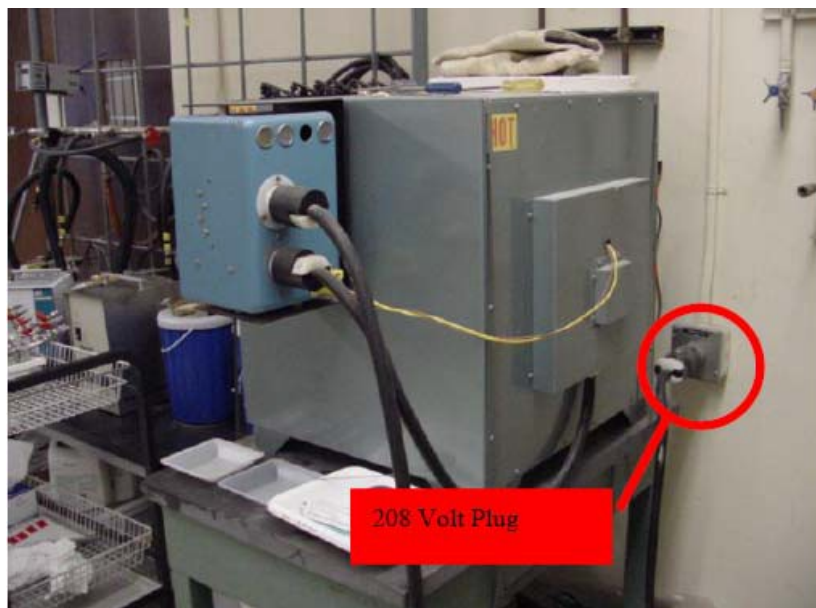


#### Action:

- Place green NRTL sticker in a visible location (front). Initial the sticker
- DO NOT apply a bar code or make an entry on the AHJ Equipment Surveyor Worksheet
- DO NOT photograph the equipment

**Example 2:**

Electrical oven (kiln). No CE, CSA or any NRTL Label.

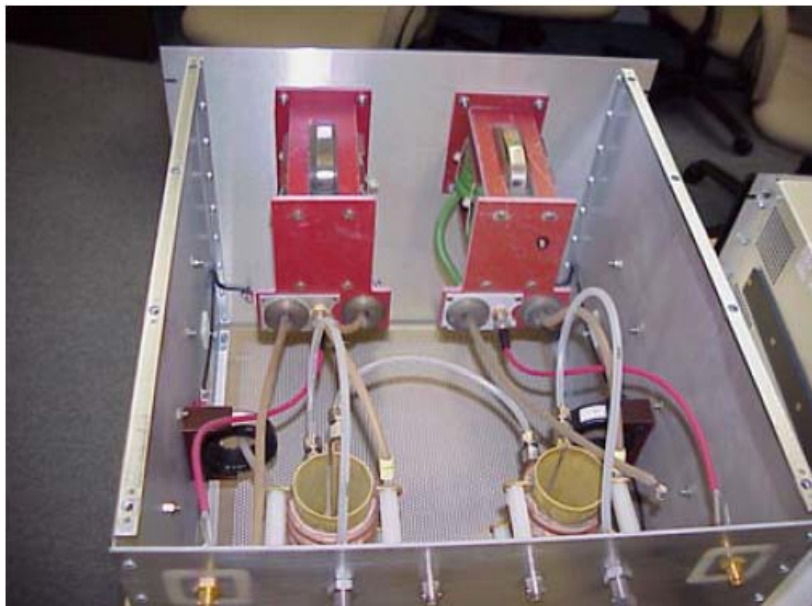
**Action:**

- Place AHJ Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as High Risk.
- Photograph the equipment (front and back) for later database input



**Example 3:**

High Voltage Bin, High voltage inputs, greater than 50V and greater than 5 milliamps. Non-NRTL equipment, fabricated on site at LBNL.

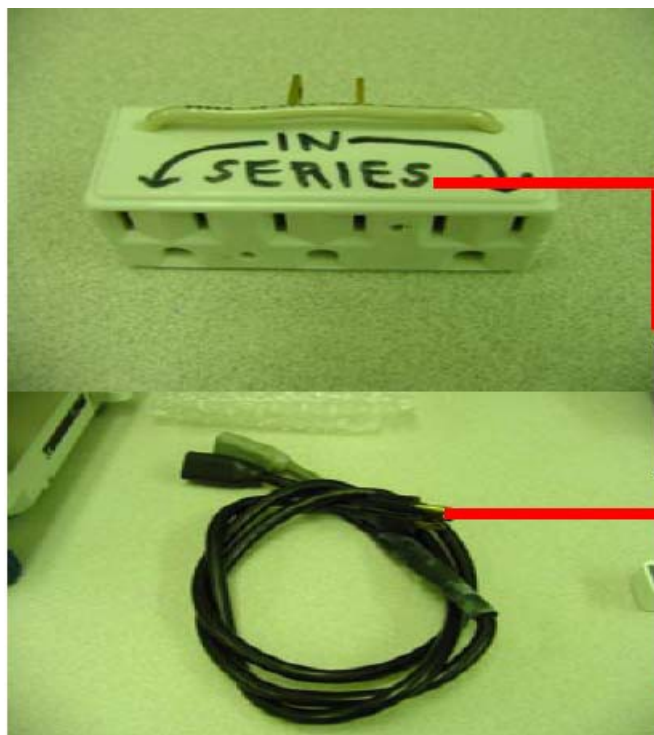
**Action:**

- Place Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as High Risk (because LBNL built)
- Photograph the equipment for later database input



**Example 4:**

NRTL equipment that has been modified: DO NOT SURVEY. Contact the EESP Manager, ext. 4694, for guidance.



This UL listed adaptor has been taken apart and rewired. (Note the exterior wire)

NOTE: EQUIPMENT THAT HAS ONLY BEEN *REPAIRED* IS NOT CONSIDERED TO BE *MODIFIED* AS LONG AS THE REPAIR WAS DONE BY A QUALIFIED PERSON USING APPROPRIATE PARTS

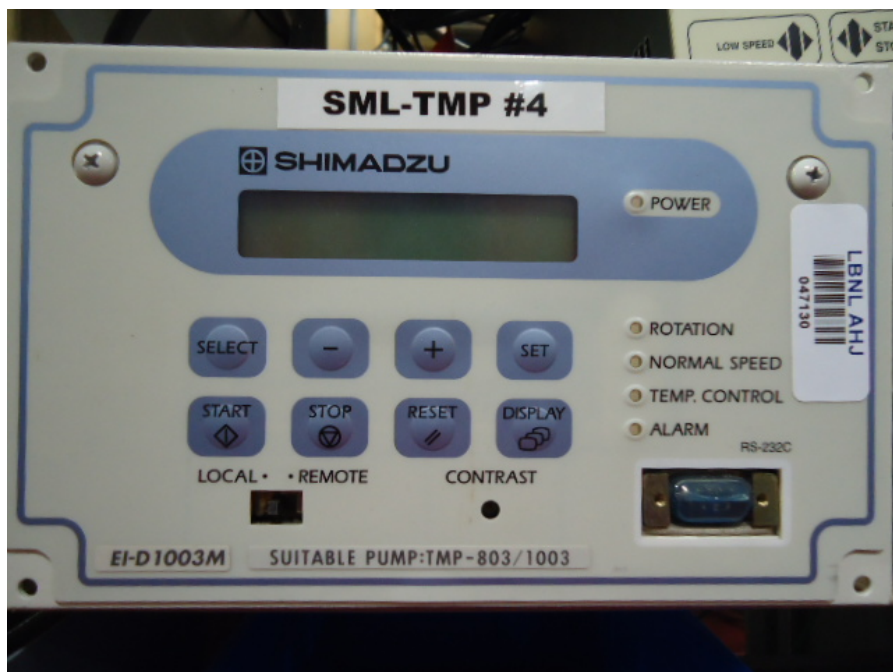
Two UL listed extension cords were joined together to create a "Y" cord. (Note the shrink tubing)

**Action:**

- Do not survey, contact the EESP manager, ext. 4694, for guidance.

### Example 5:

Shimadzu Power Supply. 120V equipment, plug and cord.



### Action:

- Place Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as Low Risk (because it has been built to CSA standards)
- Photograph the equipment for later database input

**Example 6:**

Carbolite Oven. 208V equipment, plug and cord.

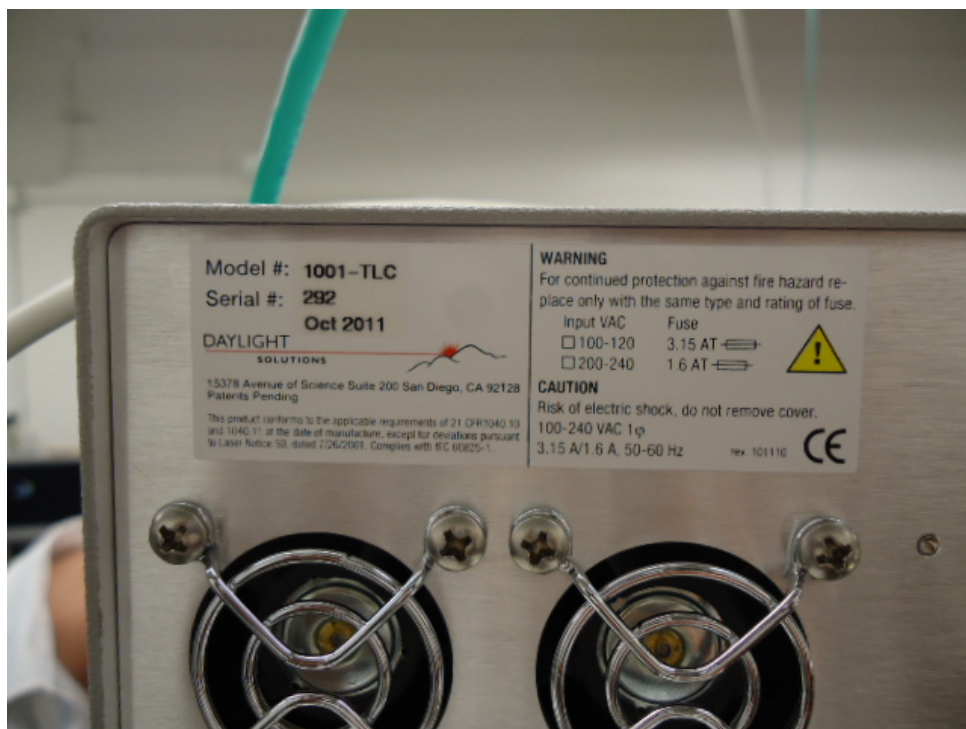
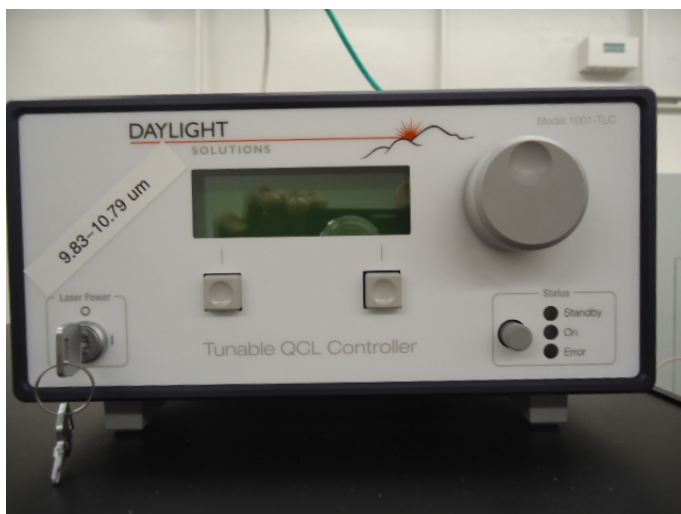
**Action:**

- Place Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as Medium Risk (because it is 208V equipment built to CE standards)
- Photograph the equipment for later database input



## Example 7:

Daylight Solutions Tunable QCL Controller. 120V equipment, plug and cord.

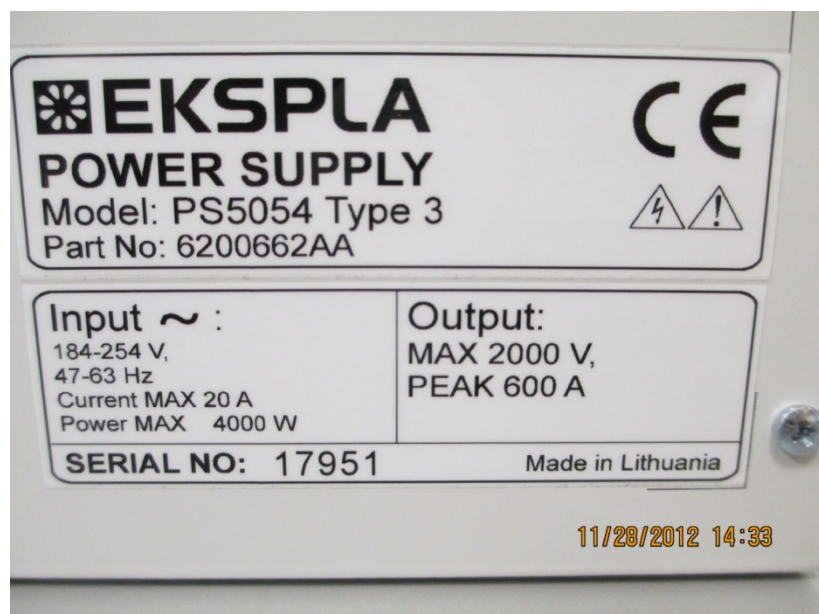


### Action:

- Place Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as Low Risk (because it is 120V equipment built to CE standards)
- Photograph the equipment for later database input

**Example 8:**

EKSPLA Power Supply. 208V equipment, plug and cord.

**Action:**

- Place Bar Code Sticker on equipment.
- Enter equipment information on the Equipment Surveyor Worksheet as Medium (because it is 208V equipment built to CE standards)
- Photograph the equipment for later database input

**Example 9:**

Thermal Cycler, New, commercial, non-NRTL equipment

**Action:**

- Place AHJ Bar Code Sticker on equipment
- Enter equipment information on the AHJ Equipment Surveyor Worksheet as High Risk (because no CE or CSA logo)
- Photograph the equipment for later database input

**Example 10:**

Muti-outlet Box. LBNL made assembly of circuit breakers and receptacles.  
Non-NRTL equipment that is the responsibility of Facilities.



Note:  
Batman is  
NOT an  
NRTL

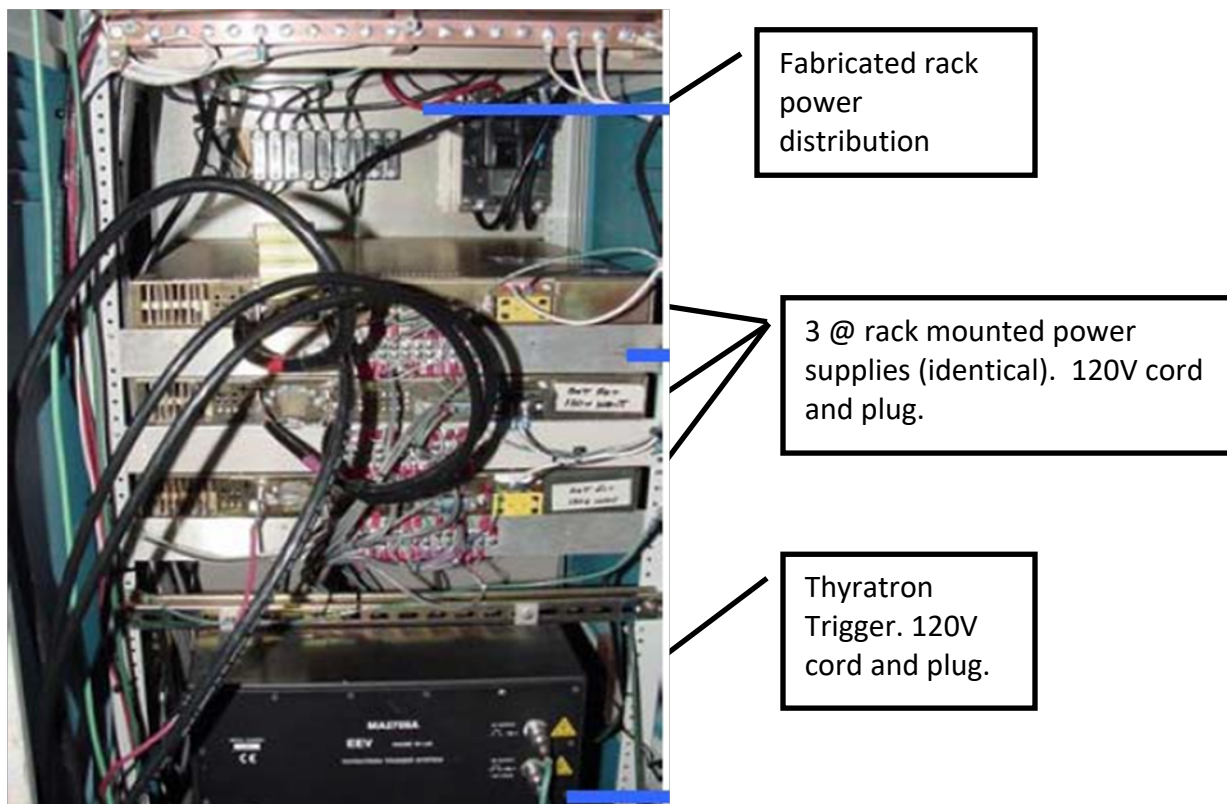
**Action:**

- Do not survey since this is the responsibility of the Facilities Department.



### Example 11:

Equipment Rack with built-in power distribution and installed equipment, all non-NRTL. Individual chassis may occasionally be exchanged, so it is treated as individual and separate pieces of equipment, rather than one system.



#### Actions:

- Place AHJ Bar Code Stickers on **each** piece of equipment: the chassis rack, the 3 DC power supplies, and the thyatron trigger chassis. (5 bar codes total).
- Enter all equipment information on the Equipment Surveyor Worksheet all High Risk because no CE or CSA label)
- Photograph the equipment for later database input



**EQUIPMENT SURVEYOR WORKSHEET**Date **12/6/12**

Information for the EEIP Database only;

Do not record NRTL equipment

(NOTE: When entering bar code number, you may omit the leading zeros)

Surveyor Name **Julius Marx**

Division	EH&S
Building	75B
Room #	107A
Other Location Info	N/A
Responsible Person	Margaret DuMont
Email	<a href="mailto:mdumont@lbl.gov">mdumont@lbl.gov</a>

Barcode	201	Equip Name	Electric Oven (kiln)
Manuf.	Unknown	Model/Serial No.	Unknown
Equip. Type*	2	Environment**	I
Other Equip. Markings***	4	Risk Group ****	H
Comments	208 V plug/cord, control box attached to side.		

Barcode	202	Equip Name	High voltage bin
Manuf.	LBNL	Model	N/A
Equip. Type*	4	Environment**	I
Other Equip. Markings***	4	Risk Group ****	H
Comments	LBNL, Non-NRTL		

Barcode	203	Equip Name	Power Supply
Manuf.	Shimadzu	Model	EI-D1003M
Equip. Type*	1	Environment**	I
Other Equip. Markings****	2	Risk Group *****	L
Comments	120V plug/cord, CSA		

* "Equip. Type" Choices:	** "Environment" Choices:	*** "Other Equip. Markings Choices:	**** "Risk Group" Choices:
1 = Commercially made 120V plug-in 2 = Commercially made, 208V 3 = Other commercially made equipment 4 = LBNL Made 5 = Other Custom Made 6 = Powered Rack 7 = Powered Bench 8 = System / Assembly	I = Indoor Dry C = Chemical Hood G = Glove Box H = Hazardous Location O = Outdoor	1 = CE 2 = Other Similar Markings 3 = System Assembly/Multiple Equipment 4 = Unmarked	L = Low M = Medium H = High

## EQUIPMENT SURVEYOR WORKSHEET (pg.2)

Information for the EEIP Database only; Do not record NRTL equipment

Barcode	204	Equip Name	Oven
Manuf.	Carbolite	Model	PF200
Equip. Type*	2	Environment**	I
Other Equip. Markings***	1	Risk Group ****	M
Comments	208V plug/cord, CE		

Barcode	205	Equip Name	Tunable QCL Controller
Manuf.	Daylight Solutions	Model	1001-TLC
Equip. Type*	1	Environment**	I
Other Equip. Markings***	1	Risk Group ****	L
Comments	120V, CE		

Barcode	206	Equip Name	Power Supply
Manuf.	EKSPLA	Model	PS5054 Type 3
Equip. Type*	2	Environment**	I
Other Equip. Markings***	1	Risk Group ****	M
Comments	208V cord/plug, CE		

Barcode	207	Equip Name	Thermal Cycler
Manuf.	MJ Research, Watertown MA	Model	PTC-2000
Equip. Type*	1	Environment**	I
Other Equip. Markings***	4	Risk Group ****	H
Comments	120 Volt, Unmarked		

* "Equip. Type" Choices:	** "Environment" Choices:	*** "Other Equip. Markings Choices:	**** "Risk Group" Choices:
1 = Commercially made 120V plug-in 2 = Commercially made, 208V 3 = Other commercially made equipment 4= LBNL Made 5 = Other Custom Made 6 = Powered Rack 7 = Powered Bench 8 = System / Assembly	I = Indoor Dry C = Chemical Hood G = Glove Box H = Hazardous Location O = Outdoor	1= CE 2= Other Similar Markings 3=System Assembly/Multiple Equipment 4= Unmarked	L = Low M = Medium H = High

**EQUIPMENT SURVEYOR WORKSHEET**

Information for the EEIP Database only;

Date 12/6/12

Do not record NRTL equipment

Surveyor Name Julius Marx

Division	EH&S
Building	75B
Room #	107A
Other Location Info	N/A
Responsible Person (RP)	Margaret Dumont
Email	<a href="mailto:mdumont@lbl.gov">mdumont@lbl.gov</a>

Barcode	208	Equip Name	Chassis Rack
Manuf.	Unknown, LBNL modified	Model	N/A
Equip. Type*	5	Environment**	I
Other Equip. Markings***	3	Risk Group ****	H
Comments	Power distribution installed by LBNL		

Barcode	208	Equip Name	Power supply
Manuf.	Sorensen-San Diego, CA	Model	DCS8-125E
Equip. Type*	1	Environment**	I
Other Equip. Markings***	3	Risk Group ****	H
Comments	120 Volt, Unmarked		

Barcode	209	Equip Name	Power supply
Manuf.	Sorensen-San Diego, CA	Model	DCS8-125E
Equip. Type*	1	Environment***	I
Other Equip. Markings****	3	Risk Group *****	H
Comments	120 Volt, Unmarked		

* "Equip. Type" Choices:	** "Environment" Choices:	*** "Other Equip. Markings Choices:	**** "Risk Group" Choices:
1 = Commercially made 120V plug-in 2 = Commercially made, 208V 3 = Other commercially made equipment 4 = LBNL Made 5 = Other Custom Made 6 = Powered Rack 7 = Powered Bench 8 = System / Assembly	I = Indoor Dry C = Chemical Hood G = Glove Box H = Hazardous Location O = Outdoor	1 = CE 2 = Other Similar Markings 3 = System Assembly/Multiple Equipment 4 = Unmarked	L = Low M = Medium H = High

## EQUIPMENT SURVEYOR WORKSHEET (pg.2)

Information for the EEIP Database only; Do not record NRTL equipment

Barcode	210	Equip Name	Power supply
Manuf.	Sorensen-San Diego, CA	Model	DCS8-125E
Equip. Type*	1	Environment***	I
Other Equip. Markings****	3	Risk Group *****	H
Comments	120 Volt, Unmarked		

Barcode	211	Equip Name	Thyratron Trigger
Manuf.	EEV (UK)	Model	MA2709A
Equip. Type*	2	Environment**	I
Other Equip. Markings***	3	Risk Group *****	H
Comments	208 volt, Unmarked		

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group *****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group *****	
Comments			

* "Equip. Type" Choices:	** "Environment" Choices:	*** "Other Equip. Markings Choices:	**** "Risk Group" Choices:
1 = Commercially made 120V plug-in 2 = Commercially made, 208V 3 = Other commercially made equipment 4= LBNL Made 5 = Other Custom Made 6 = Powered Rack 7 = Powered Bench 8 = System / Assembly	I = Indoor Dry C = Chemical Hood G = Glove Box H = Hazardous Location O = Outdoor	1= CE 2= Other Similar Markings 3=System Assembly/Multiple Equipment 4= Unmarked	L = Low M = Medium H = High

## TEST EXERCISE

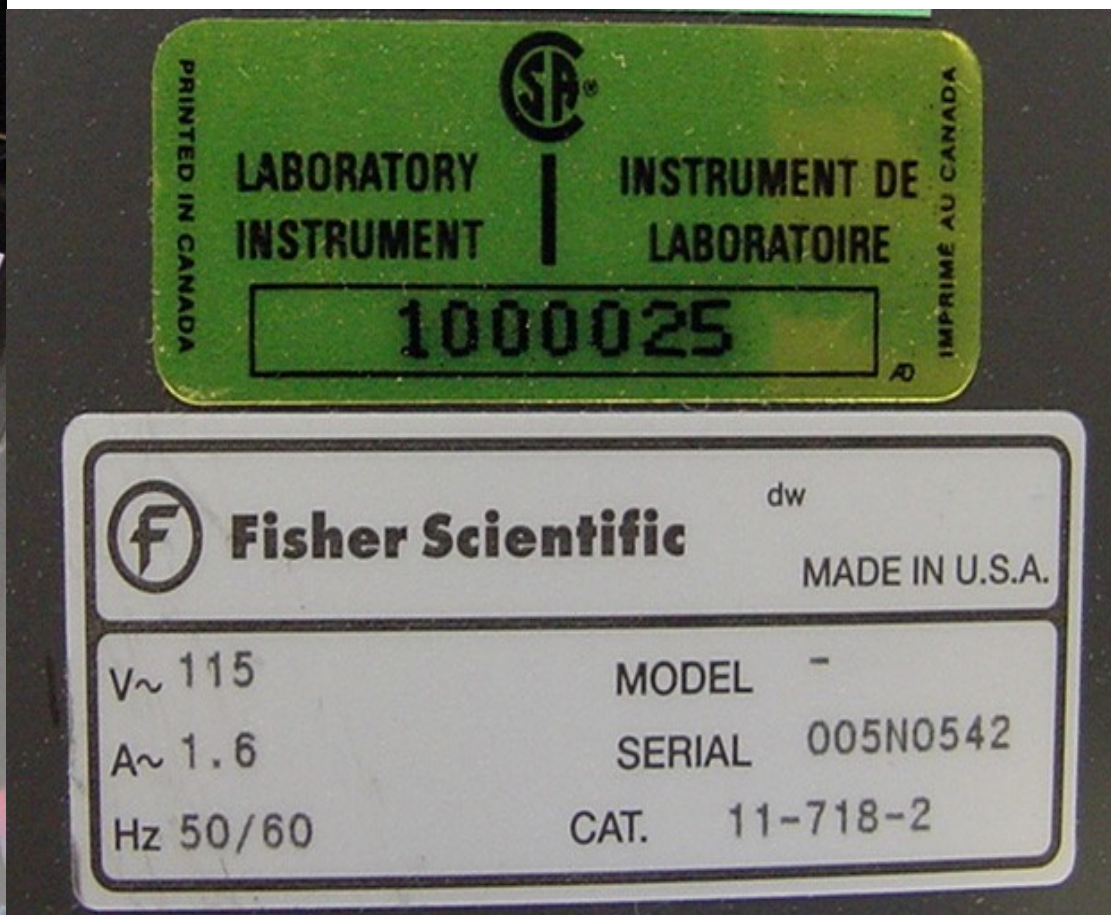
### Instructions:

1. Print (double-sided if possible) the blank worksheets located at the end of this exercise (page 38). hand-write your answers directly on the worksheets.
2. Review all of the equipment examples. for purposes of this exercise, assume the following:
  - a. Use your name for surveyor.
  - b. Equipment supervisor (responsible person) is: **e. Lawrence.**
  - c. His email is **eolawrence@lbl.gov.**
  - d. His division is **physics.**
  - e. All of the equipment is in building is **50a**; room **4133.**
  - f. The first barcode in your sequence is **231.**
3. For each piece of equipment, determine whether the equipment needs examination by an LBNL equipment inspector. (see appendices b and c for acceptable and unacceptable marks.)
  - a. If it **does**, enter the equipment information on the blank worksheet.
  - b. If it **does not**, do not record equipment information on the worksheet.
4. Sign and return the completed worksheet via lab mail to: **mark scott, 78-0101g**

**Upon satisfactory completion of this exercise, you will be issued a supply of AHJ bar codes and colored stickers.**

**You will also be provided with instructions in how to use the AHJ database. Information about the equipment you survey for your program will be recorded in this database.**

## #1: Dry Bath Incubator, cord &amp; plug



(Rear panel)



#2 Power supply bin, 120V, rack mounted, cord and plug. You are assessing the bin, not the control cards that slide into the bin.



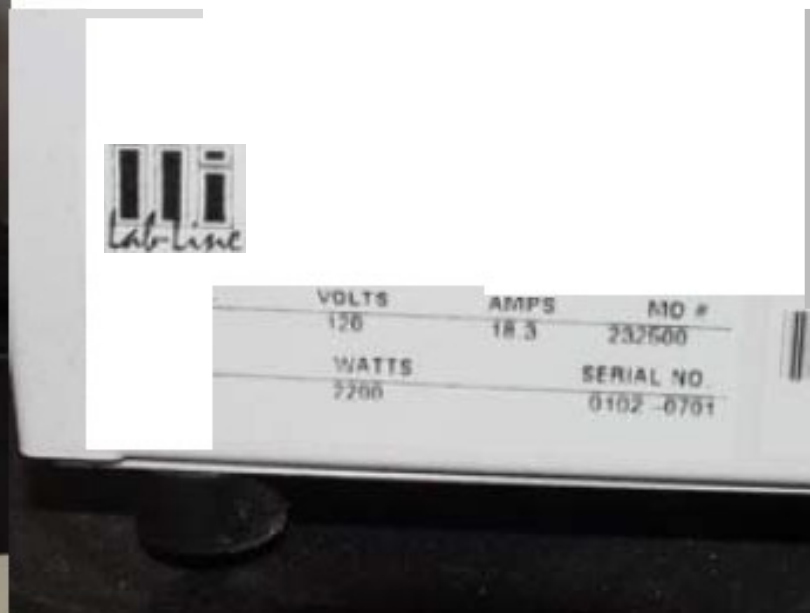
### #3 Ultrasonic Cleaner, cord & plug



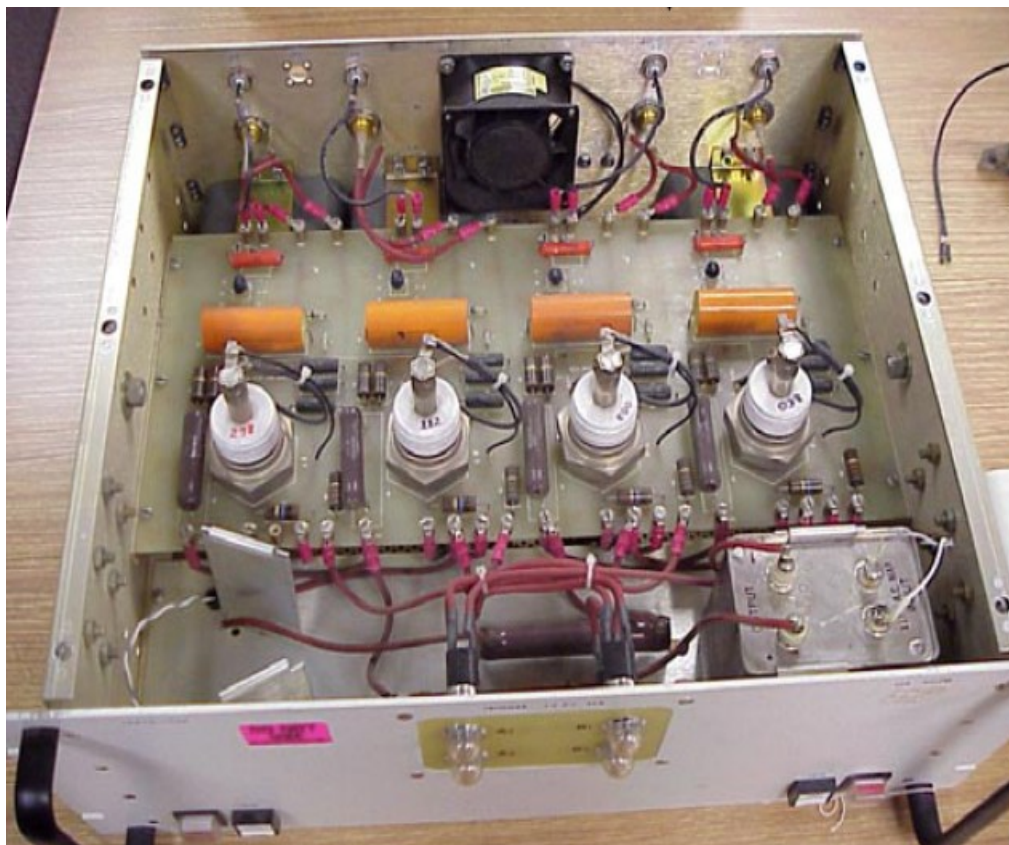




## #5 Magnetic stirrer, cord &amp; plug



**#6 Trigger Chassis, made by Livermore Lab. Input is greater than 50Volts and greater than 5 milliamps. It is not connected to power now. There is no cover for the chassis.**



## #7 Laser Controller, cord & plug, 208Volts

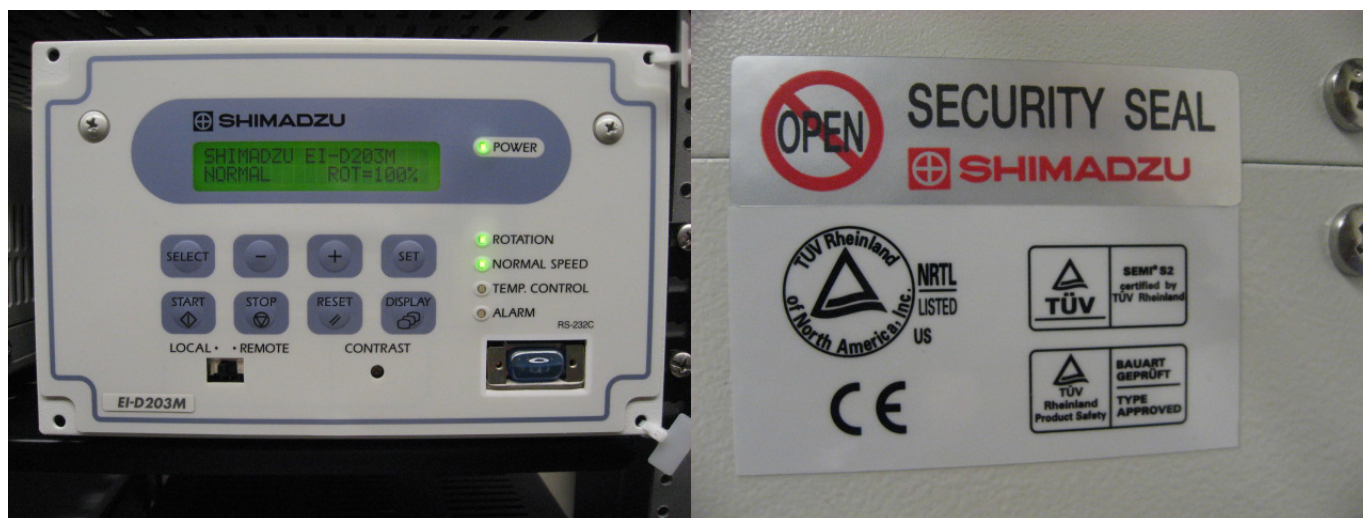




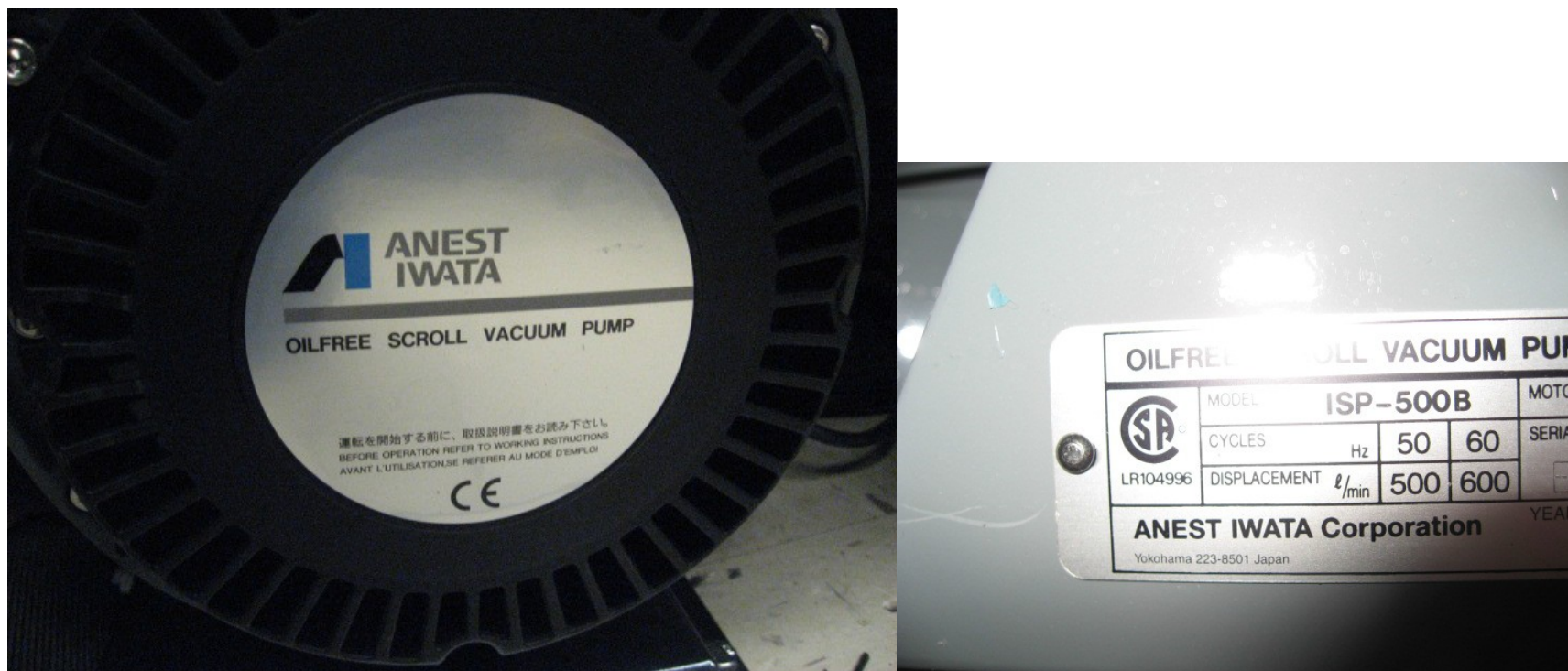
## #8. Lytron Recirculating Chiller, 120V, cord & plug



## #9 Vacuum Pump Power Supply, 120V cord & plug



#10. Vacuum Pump, 208V, direct connected with flexible conduit





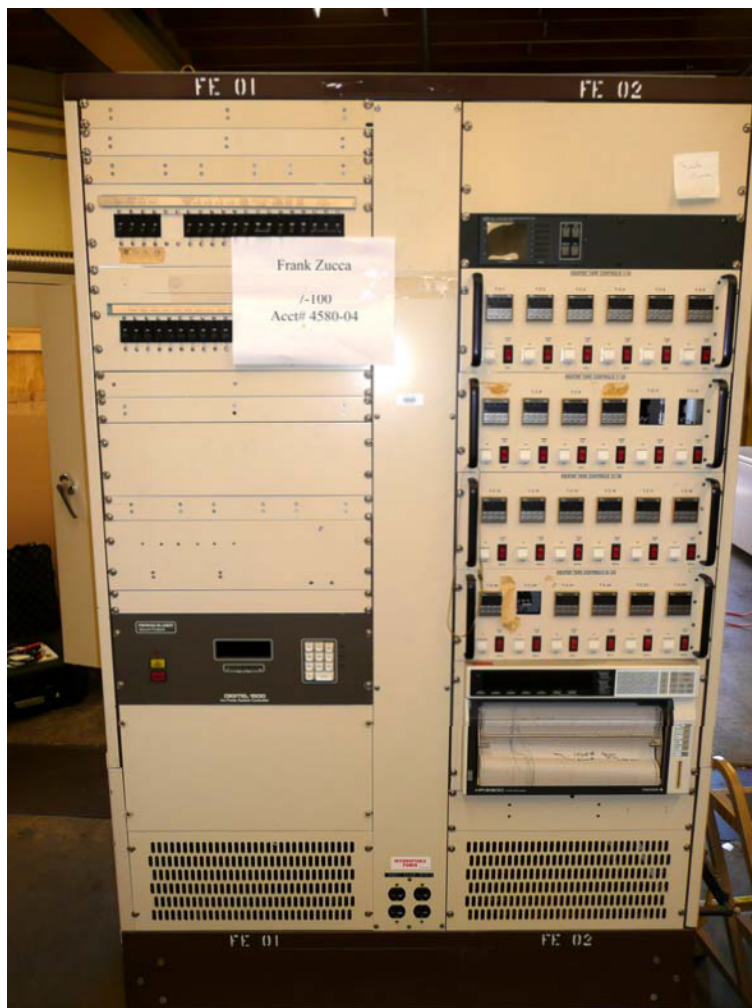
**#11 Multi-outlet Box, (MO Box), LBNL –built, Mounted to wall; 208 volt; supplied by conduit.  
(Hint: this is considered “Facilities Equipment” )**





**#12. Portable power and control unit for vacuum bake-outs. LBNL made. Connects with 208 volt, 30 amp cord.**

**Equipment consists of several chassis, sensors, and power supplies mounted in a rolling cabinet that has internal power distribution. This will be assessed as a single system.**



**END OF TEST EXAMPLES. BEGIN FILLING OUT SURVEYOR WORKSHEETS ON NEXT PAGE.**

**TEST****EQUIPMENT SURVEYOR WORKSHEET**

Date \_\_\_\_\_

Information for the EEIP Database only;

Do not record NRTL equipment

Surveyor Name \_\_\_\_\_

Division	
Building	
Room #	
Other Location Info	
Responsible Person	
Email	

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

<b>* “Equip. Type” Choices:</b>	<b>** “Environment” Choices:</b>	<b>*** “Other Equip. Markings Choices:</b>	<b>**** “Risk Group” Choices:</b>
1 = Commercially made 120V plug-in 2 = Commercially made, 208V 3 = Other commercially made equipment 4= LBNL Made 5 = Other Custom Made 6 = Powered Rack 7 = Powered Bench 8 = System / Assembly	I = Indoor Dry C = Chemical Hood G = Glove Box H = Hazardous Location O = Outdoor	1= CE 2= Other Similar Markings 3=System Assembly/Multiple Equipment 4= Unmarked	L = Low M = Medium H = High

**TEST**

## EQUIPMENT SURVEYOR WORKSHEET (pg.2)

Information for the EEIP Database only;

Do not record NRTL equipment

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment***	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment***	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment***	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment***	
Other Equip. Markings***		Risk Group ****	
Comments			

<b>* “Equip. Type” Choices:</b>	<b>** “Environment” Choices:</b>	<b>*** “Other Equip. Markings Choices:</b>	<b>**** “Risk Group” Choices:</b>
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**TEST****EQUIPMENT SURVEYOR WORKSHEET**

Date \_\_\_\_\_

Information for the EEIP Database only;

Do not record NRTL equipment

Surveyor Name \_\_\_\_\_

Division	
Building	
Room #	
Other Location Info	
Responsible Person	
Email	

Barcode		Equip Name	
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Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
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<b>* “Equip. Type” Choices:</b>	<b>** “Environment” Choices:</b>	<b>*** “Other Equip. Markings Choices:</b>	<b>**** “Risk Group” Choices:</b>
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**TEST**

## EQUIPMENT SURVEYOR WORKSHEET (pg.2)

Information for the EEIP Database only;

Do not record NRTL equipment

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Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

**READ AND SIGN:**

I HAVE READ AND UNDERSTAND THE CONTENTS OF THIS COURSE. I HAVE COMPLETED THIS TEST AND AM SUBMITTING IT FOR COURSE CREDIT. THIS COURSE QUALIFIES ME ONLY TO SURVEY AND MARK EQUIPMENT, NOT TO APPROVE EQUIPMENT. I WILL NOT EXPOSE MYSELF TO ELECTRICAL HAZARDS WHILE CONDUCTING EQUIPMENT SURVEYS.

SIGNED \_\_\_\_\_ DATE \_\_\_\_\_ email \_\_\_\_\_

**MAIL TEST WORKSHEETS ONLY TO MARK SCOTT, 78-0101G**

## **APPENDIX A - FIELD AID: SURVEYOR WORKSHEETS**

After passing the test, you will be given access to the EESP database.

If you do not have an iPad or Laptop, print (double-sided if possible) a supply of these worksheets to take with you into the field. Record your equipment on these worksheets for later entry into the EEIP database. Don't forget to take a photo of the equipment for later entry into the EEIP database.



**EQUIPMENT SURVEYOR WORKSHEET**

Information for the EEIP Database only;

Date \_\_\_\_\_

Do not record NRTL equipment

Surveyor Name \_\_\_\_\_

Division	
Building	
Room #	
Other Location Info	
Responsible Person	
Email	

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

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## EQUIPMENT SURVEYOR WORKSHEET (pg.2)

Information for the EEIP Database only; Do not record NRTL equipment

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Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

Barcode		Equip Name	
Manuf.		Model	
Equip. Type*		Environment**	
Other Equip. Markings***		Risk Group ****	
Comments			

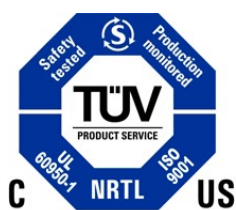
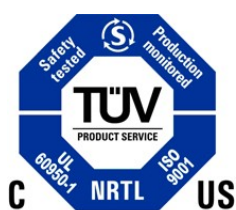
<b>* “Equip. Type” Choices:</b>	<b>** “Environment” Choices:</b>	<b>*** “Other Equip. Markings Choices:</b>	<b>**** “Risk Group” Choices:</b>
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## APPENDIX B - FIELD AID: NRTL MARKS

This list is current as of November 2012. For updates, see <http://www.osha.gov/dts/otpc/nrtl/nrtlmrk.html>.











## APENDIX C -FIELD AID: UNACCEPTABLE MARKS

Some NRTLs have both U.S. and non-U.S. marks. A non-U.S. mark means that the product may not comply with U.S. standards. Therefore, **a non-U.S. mark is NOT considered to be an NRTL-certified product**. These products should be bar-coded and logged for inspection.

The unacceptable marks (on the left) are very similar to the acceptable labels shown in the previous section

NOTE: If you are unsure about a particular label, it is better to mark, barcode, and log the equipment for further inspection than to mistakenly mark it as NRTL Certified.

The CSA label is only acceptable if accompanied by the US, C-US, NRTL, or NRTL/C markings. The plain CSA marking is NOT acceptable. It indicates that the product has only been investigated for compliance with Canadian standards.

### Unacceptable Label



Note: Mark may be any color

### Acceptable NRTL Labels



The ETL label is not acceptable if only marked with the C (Canada). It indicates that the product has only been investigated for compliance with Canadian standards. The plain ETL label and the ETL label with the C and US markings are acceptable.

### Unacceptable NRTL Label

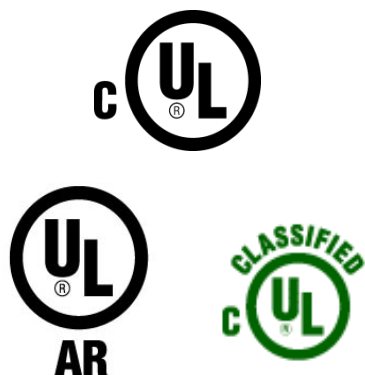


### Acceptable NRTL Labels

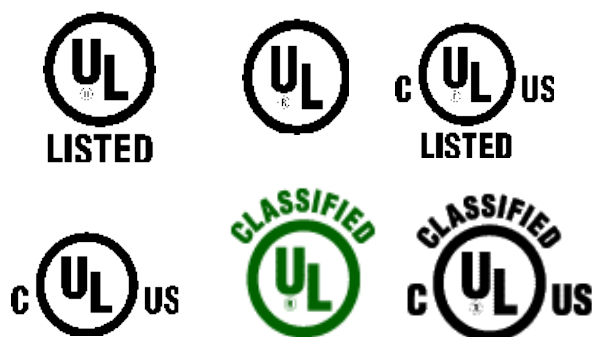


The UL label is not acceptable if accompanied only by a C, CLASSIFIED C, or AR. The plain UL or a UL accompanied by LISTED, C US, or C US LISTED is acceptable.

### Unacceptable Labels



### Acceptable NRTL Labels



The Entela label, if only accompanied by a C is NOT acceptable. Entela labels accompanied by a US or C US are acceptable.

### Unacceptable NRTL Label



### Acceptable NRTL Labels



TUV labels only accompanied by a C or marked with ISO 9001 are NOT acceptable. TUV labels accompanied by C US, US, NRTL, or NRTL LISTED are acceptable.

### Unacceptable NRTL Labels



### Acceptable NRTL Labels



MET labels only accompanied by a C are NOT acceptable. MET labels accompanied by NRTL LISTED are acceptable.




### Unacceptable NRTL Label



### Acceptable NRTL Label



## The mark.

The  mark is used by Underwriters Laboratories to identify a **Recognized Component**. A Recognized Component does not go through the same degree of testing as a finished product, therefore the  mark is not an acceptable NRTL label. If a product displays only the  mark, it must be logged into the AHJ Equipment Surveyor Worksheet and evaluated by an AHJ Field Representative.

### Unacceptable Label



## CE Marking

The CE mark is present on many pieces of equipment. CE is NOT an NRTL mark. It is NOT an acceptable label. CE is used as an economic requirement for the European community.



### Unacceptable Label